

LANDBIRDS IN THE ALASKA COMPREHENSIVE WILDLIFE CONSERVATION PLAN

Alaska is home to 135 species of breeding birds that principally use terrestrial habitats throughout the year. These birds, commonly referred to as “landbirds”, comprise the largest and most ecologically diverse component of Alaska’s avifauna and include raptors, grouse, woodpeckers, flycatchers, jays, chickadees, thrushes, warblers, and sparrows, among others (Boreal Partners in Flight 1999, Alaska Raptor Management Program 2001)¹. Collectively, landbirds occupy all terrestrial habitats in Alaska where they play vital roles in ecosystems by feeding on insect pests, pollinating plants, dispersing seeds, serving as prey, and acting as top predators. They also provide important functions to the people of Alaska by helping define our culture and contributing to our economy. The Willow Ptarmigan, for example, serves as the state bird, a traditional source of food for Alaskan Natives, and an important prey item for many predators. Moreover, the economies of many communities throughout Alaska are bolstered by the thousands of birdwatchers that visit the state each summer to view the many species of landbirds found nowhere else in North America. In order to maintain these contributions to the ecosystems and people of Alaska we must sustain viable and well distributed populations of these birds in the state through time (Boreal Partners in Flight 1999). Fundamental to achieving this goal is an understanding of the relative vulnerabilities of species and subspecies to range reductions and extinctions and using this information to focus limited resources on taxa most in need of conservation (Rich et al. 2004).

In April 2004, a group of experts met to identify landbird priority species and conservation issues for the next 10 years. The group reviewed information on the relative vulnerabilities of Alaskan landbirds based on population size, restrictions on distribution, threats to populations, and population trend (Boreal Partners in Flight 1999, Rich et al. 2004) and identified the following landbird taxa and taxa groups as the most important for conservation:

1. Aleutian and Bering Sea island endemic landbird species and subspecies (p. 3);
2. Smith’s Longspur (p. 7);
3. Landbirds sensitive to forest management (p. 11); and
4. Landbirds with long-term declines in population size (p. 17) with the Olive-sided Flycatcher (p. 22), Blackpoll Warbler (p. 27), and Rusty Blackbird (p. 32) species of particular concern within the group.

Specific goals and recommendations for conservation were developed for these birds and are included in this plan. The expert panel also recognized, however, that many additional conservation issues will need to be addressed in Alaska in order to keep our common landbirds common (Handel 2000). In addition to the birds and issues listed above, landbird conservation in Alaska will be advanced if the following issues are addressed over the next 10 years:

Assessing the changing status of Alaska’s landbirds.—Although several landbird species have been highlighted in this plan because of documented declines, there is still extremely limited information on the changing status and trends of most of Alaska’s 135 species of breeding landbirds. In particular, few are adequately monitored by any of the current monitoring programs in North America. Thus, we greatly need more effective community and species-specific inventory and monitoring programs for landbirds in Alaska to establish baselines of population size for future comparison, identify key areas and habitats for conservation, and detect population declines before species become imperiled.

Conservation of landbird taxa with small population sizes and restricted ranges.—Extremely vulnerable to threats are those birds with small populations and restricted ranges. Although Smith’s Longspur and the endemic species and subspecies of Aleutian and Bering Sea islands fall into this category and are addressed in templates in the plan, several other landbird taxa have ranges in North America that are entirely or largely restricted to Alaska. Additional taxa that should be of conservation focus in this category are: 1) the unique group of Palearctic-Nearctic migrants in Alaska, including the Alaska endemic breeding subspecies of Arctic Warbler (*Phylloscopus borealis kennicotti*), and 2) subspecies largely restricted to southeast Alaska, such as the Prince of Wales Spruce Grouse (*Falcapennis canadensis isleibi*, Dickerman and Gustafson 1996).

Protecting landbirds from large-scale threats.—In addition to forest management, several other factors threaten Alaska’s landbird populations and should be carefully studied and managed in order to conserve our birds. Global warming may be the number one future threat to birds in the region as current models predict large changes to important avian habitat. Such potential changes include shrinkage of boreal wetlands as well as substantial alterations to wind and weather patterns that may significantly increase the energetic costs of migration for our long-distance migrants. A short list of other threats includes accumulation of persistent organic pollutants, outbreaks of diseases such as West Nile virus and bill deformities, and the cumulative impacts of resource and urban development.

Conserving important non-breeding habitats outside of Alaska.—Approximately 75% of Alaska’s breeding landbird species winter outside of the state (Boreal Partners in Flight 1999). Thus efforts are needed to ensure that the conservation needs of our birds are being met along important migration pathways and wintering areas beyond our borders. Because the ranges of Alaska’s migrant birds are not confined by political borders, considerable coordination among states, provinces, and countries is needed to advance range-wide conservation for our birds.

¹ A separate group of experts addressed raptors (eagles, hawks, falcons, and owls) because their specialized conservation needs (Alaska Raptor Management Program 2001). However, we included in our discussion grouse and ptarmigan—game species in Alaska—because the conservation needs of these birds were not addressed by any management plan in the state and several populations were either undergoing range-wide population reductions or were threatened by current land management practices in Alaska.

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Aleutian and Bering Sea island endemic landbird species and subspecies

A. Species description: All of these subspecies and species have extremely restricted ranges to a small number of islands within the Aleutian Islands, adjacent islands off the Alaska Peninsula, or Bering Sea Islands. We do not include subspecies that are widely distributed within this region such as Snow Bunting (*Plectrophenax nivalis townsendi*; Pribilof, Aleutian, and Shumagin islands) and Song Sparrow (*Melospiza melodia sanaka*; central Aleutians, Alaska Peninsula and adjacent islands) since their populations are not as threatened as the taxa included herein.

Common names/Scientific names: Systematics follow Gibson and Kessel (1997).

Rock Ptarmigan, *Lagopus mutus evermanni*, *L. m. townsendi*, *L. m. atkensis*

Winter Wren, *Troglodytes troglodytes meligerus*, *T. t. kiskensis*, *T. t. alascensis*, *T. t. semidiensis*

Song Sparrow, *Melospiza melodia maxima*

Gray-crowned Rosy Finch, *Leucosticte tephrocotis tumbrina*

McKay's Bunting, *Plectrophenax hyperboreus*

B. Distribution and abundance

Range: Distributions described from [Gibson and Kessel 1997, and Gibson and Byrd (in prep.)].

Alaska range comments:

Rock Ptarmigan

Lagopus mutus evermanni: Resident to Attu Island (reintroduced to Agattu in 2003).

L. m. townsendi: Resident to Rat Islands (Kiska to Amchitka)

L. m. atkensis: Resident to Andreanof Islands (Tanaga to Atka, possibly Amlia).

Winter Wren

Troglodytes troglodytes meligerus: Resident to Near Islands (Attu and Agattu)

T. t. kiskensis: Resident from Rat Islands (Kiska) east to islands off Alaska Peninsula (Amak and Amagat).

T. t. alascensis: Resident to Pribilof Islands

T. t. semidiensis: Resident to Semidi Islands

Song Sparrow

Melospiza melodia maxima: Resident from the Andreanof Islands to the Near Islands (Attu to Atka, possibly Amlia) in the Aleutians.

Gray-crowned Rosy Finch

Leucosticte tephrocotis tumbrina: Breeds on Pribilofs and St. Matthew and Hall islands. Resident on the Pribilof islands.

McKay's Bunting

Breeds on St. Matthew and Hall islands, potentially on St. Lawrence and Pribilof islands. Winters on the mainland along the Bering Sea coast, where it is considered a rare to uncommon migrant and visitant (Kessel and Gibson 1978) principally south of Norton Sound and north of Bristol Bay, including Nunivak Island. Casual winter visitant in the Aleutian Islands (Kessel and Gibson 1978).

Abundance:

Global abundance comments: Estimates from Rich et al. (2004) are likely inaccurate but are the only current estimates for these species.

Rock Ptarmigan: 8,200,000 individuals

Winter Wren: 36,000,000 individuals

Song Sparrow: 54,000,000 individuals

Gray-crowned Rosy Finch: 200,000 individuals

McKay's Bunting: 34,000 breeding individuals (S. M. Matsuoka unpublished data from 2003 survey).

State abundance comments: Numerical estimates of population size are not available for any of the subspecies below.

Rock Ptarmigan: Aleutian subspecies are considered uncommon or fairly common residents and breeders throughout the Aleutians with density ranging from 0.14 – 0.30 prs./ha; however, does not occur on all islands (Gibson and Byrd, in prep.).

Winter Wren: Aleutian subspecies (*T. t. meligerus* and *T. t. kiskensis*) considered uncommon residents and breeders throughout the Aleutians; however density varies considerably among islands (high at Buldir and Amchitka; low at Adak and Agattu; extirpated from Amchitka, presumably from rats; Gibson and Byrd, in prep). *T. t. alascensis* considered an uncommon to rare breeder on the Pribilof islands (D.R. Ruthrauff personal communication). No estimates the Semidi island subspecies (*T. t. semidiensis*).

Song Sparrow: *M. m. maxima* considered uncommon to common residents and breeder (Gibson and Byrd, in prep.).

Gray-crowned Rosy Finch: Unknown but likely less than 10,000 individuals (D.R. Ruthrauff personal communication).

McKay's Bunting: 34,000 breeding individuals (S. M. Matsuoka unpublished data).

Trends:

Global trends:

Rock Ptarmigan, Gray-crowned Rosy Finch and McKay's Bunting: no estimates of trends available.

Winter Wren: Abundance in North America increased from 1980–2003 (trend = 2.3%/year; $P < 0.01$, $n = 742$ routes; Sauer et al. 2004).

Song Sparrow: Abundance in North America remained stable from 1980–2003 (Sauer et al. 2004).

State trends:

Statewide trends from the North American Breeding Bird Survey that include many other subspecies estimate that both Winter Wrens (trend = -1.4%/year; $P = 0.14$, $n = 21$ routes) and Song Sparrows (trend = -1.4%/year, $P = 0.44$, $n = 31$ routes) have declined in abundance from 1980–2003 (Sauer et al. 2004). Statewide trends for Rock Ptarmigan, Gray-crowned Rosy Finch, and McKay's Bunting are unknown.

Introduced foxes have reduced population of Rock Ptarmigan on most of the Aleutian Islands and extirpated them from at least six. Ptarmigan do increase in numbers following the removal of foxes from islands; however foxes have not been removed from all islands (Gibson and Byrd in prep). Subspecies of Winter Wrens, and Song Sparrows endemic to the Aleutian Islands have been reduced in numbers from introduced foxes and rats. These subspecies have not responded dramatically to removals of foxes, presumably because of continued predation from rats (Gibson and Byrd in prep; V. Byrd, personal communication).

C. Problems, issues, or concerns for species (or species group)

These taxa have extremely small population sizes and ranges that are restricted to a small number of islands. Therefore they are particularly susceptible to extirpation from disease, disturbance, and introduced predators. Introduction of mammals, particularly rats and foxes, to islands in the region is the largest concern. On many of the Aleutian islands Rock Ptarmigan, Winter Wrens and Song Sparrows have already been extirpated or reduced in numbers from such introductions (Gibson and Byrd in prep.). Unintended introductions of rats from shipping and fishing vessels are a continual high threat to populations even in areas with aggressive rat prevention programs (e.g., St. Paul Island).

D. Identify location and condition of key or important habitat areas

Habitats used by these subspecies are generally intact. On the Pribilof islands introduced reindeer are degrading habitats used by Winter Wrens and Gray-crowned Rosy Finches. Habitats used by McKay's Buntings on St. Matthew Island have also been degraded by introduced reindeer, however, these ungulates have been absent from the island since the early 1980's.

Contamination from military sites is a chronic issue throughout the Aleutian and Pribilof islands but its effects on populations of these birds is currently unknown. The primary factor that threatens this group of birds is introductions of mammalian predators which have already greatly reduced and even eliminated populations from islands. The entire breeding ranges of these taxa are encompassed by the Alaska Maritime Wildlife Refuge.

Wintering and migration habitats for McKay's Buntings along coastal areas of western Alaska between Norton Sound and Bristol Bay are poorly known. Winter range for this species includes large conservation units (Yukon Delta and Togiak National Wildlife Refuges); however, many Native owned land holdings that lie within the

administrative boundaries of these areas may pose development threats such as wind energy development.

E. Identify threats or concerns associated with key habitats

See D.

F. Goal: Ensure subspecies populations are viable within natural variation throughout their distribution in Alaska.

G. Develop objectives, etc., for Conservation and Management Needs

State conservation and management needs:

Objective 1: Increase population size on islands with introduced foxes and rats.

Target: Suspected population size prior to introduction of foxes and rats, or double current population size if such information is unavailable.

Measure: Population trend estimated from periodic surveys.

Issues: Many of the islands with introduced foxes and rats are large and remote making the removal of these exotic mammals extremely difficult and expensive.

Conservation actions:

- a. Remove or reduce in number introduced rats and foxes from selected Aleutian Islands.
- b. Maintain and potentially expand current program to control, eradicate, and prevent introductions of exotic mammalian predators.
- c. Use results from recently initiated tests to eradicate rats from selected Aleutian Islands to develop and implement a strategy for the widespread removal of rats from the island system.
- d. Measure the efficacy of exotic species management by monitoring numerical and possibly demographic responses of birds to control and eradication efforts.
- e. Reintroduce Rock Ptarmigan to islands from which they have been extirpated following control or removal of foxes.

Objective 2: On islands currently without introduced mammalian predators (i.e., foxes and rats) maintain species widely distributed across the current range at population sizes within the range of natural population cycles.

Target: Stable geographic breeding distribution and population trend. For McKay's Bunting the target population size is the 2003 estimate of 34,000 breeding individuals (S. M. Matsuoka, unpublished data).

Measure: Population trend estimated from periodic surveys.

Issues: Introduction of foxes, rats, reindeer and other introduced mammals are the primary threat for these birds.

Conservations action:

- f. Protect islands from introductions of foxes, rats, and reindeer.

Issues: Standardized surveys such as the Breeding Bird (BBS) and Alaska Landbird Monitoring (ALMS) surveys currently do not sample these islands with sufficient intensity to monitor these bird taxa. Many of these islands are remote and therefore logistically challenging and expensive to sample. Introductions of foxes and rats are a continual threat. Little is known about demographics of any of these taxa.

Conservation action:

- g. Design and implement surveys to measure breeding population size or an index of abundance periodically to estimate population trends. If surveys have already been conducted in key locations they should be evaluated to determine if they provided a sound baseline of abundance or population size. If so such surveys should be resampled periodically and potentially expanded so as to detect a 25% decline in population size over 10 years.

Issues: Unlike the other avian taxa in this group, McKay's Buntings are migratory, leaving breeding islands to winter on the mainland coast of the Bering Sea in Alaska. Once outside of the islands on which they breed they

are subjected to several additional potential threats. This further complicates the conservation of this species.

Conservation action:

- h. For McKay's Buntings, identify key migration and wintering habitats and threats to populations during the non-breeding season. In particular assess the threat of wind turbines in coastal communities to wintering and migrating birds.
- a. Conduct mark-recapture study during winter to estimate survival and recruitment. Use demographic information coupled with information from breeding studies on McKay's Buntings or similar species to develop population models to determine if deficits in adult survival, nesting success, or recruitment are most likely to cause populations to decline.

Issue: If species are found to decline below 20% of current population size.

Conservation action:

- i. Investigate the causes of declines and develop remedial actions for both stabilizing populations and returning them to target levels.

H. Propose plan & time frames for monitoring species and their habitats

The U.S. Fish and Wildlife Service's Alaska Maritime National Wildlife Refuge will be a key partner in managing this group of birds, particularly through prevention, control and eradications programs for introduced mammalian predators, many of which are ongoing. The Yukon Delta and Togiak National Wildlife Refuges and Native villages on western Alaska coast and the State of Alaska for lands on the northern Alaska Peninsula will be important partners for studying and conserving McKay's Buntings on migration and wintering grounds.

I. Recommend time frame for reviewing and revising the Strategy

Ten years unless monitoring suggests that population have fallen below target levels.

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Smith's Longspur

A. Species description [or Species Group description]

Common name: Smith's Longspur

Scientific name: *Calcarius pictus*

B. Distribution and abundance

Range:

Global range comments: Breeds from n. Alaska, n. Yukon Territory, and n. Mackenzie to s. Keewatin, n. Manitoba, and n. Ontario. Small disjunct population in extreme nw. British Columbia and the uplands of se.-central Alaska. Breeding range incompletely known but assumed to encompass suitable habitat across the tree-line west of James Bay to Alaska. Winter distribution limited to the southern great plains from Kansas and central Iowa south to Oklahoma, central Texas, and nw. Louisiana east to Arkansas, Mississippi, Tennessee, and Alabama. High relative numbers of wintering birds in north-central and northeastern Oklahoma (Grzybowski 1982, Dunn and Dunn 1999).

State range comments: Found in two areas in Alaska: Brooks Range and northern foothills and uplands of se.-central Alaska. In the Brooks Range they are found as far west as the Noatak headwaters (Kessel and Gibson 1978), and north to the confluence of the Colville and Kogosukruk rivers (Johnson and Herter 1989). Considered a fairly common breeder in the e. Brooks Range, at least as far west as Anaktuvuk Pass. Confirmed or probable breeder in the Kongakut, Sheenjek, Hulahula, Canning, Atigun, Sagavanirktok, and Ribdon river valleys. Uncommon to rare breeder west of Anaktuvuk Pass. Rare breeder or probable breeder in Wrangell Mountains, along Denali highway, Mt. Fairplay area, Tanana-Yukon highlands and White Mountains (Kessel and Gibson 1978).

Abundance:

Global abundance comments: The total population size of Smith's Longspur is unknown, but breeding densities in suitable breeding habitat suggest it does not exceed 75,000 birds (Briskie 1993). Population size likely far less than this.

State abundance comments: Unknown

Trends:

Global trends: Unknown

State trends: Unknown

C. Problems, issues, or concerns for species (or species group)

Small population size coupled with restricted breeding and winter distribution makes this species particularly susceptible to population decline. Smith's Longspur is not currently monitored by any of the North America's avian monitoring programs (Rich et al. 2004). This species uses grasslands during winter in a limited portion of the southern Great Plains (Dunn and Dunn 1999) where land is primarily privately owned and heavily managed through grazing, burning, and frequent use of herbicides and pesticides. Breeding range in Alaska is incompletely known. Considered one of the more poorly studied birds in North America (Ehrlich et al. 1998). Factors controlling population size are unknown although breeding success is strongly affected by predation levels and climatic conditions (Briskie 1993).

D. Identify location and condition of key or important habitat areas

Isolated breeding areas largely protect this species from direct human disturbance during part of the year. In northern Alaska in the Brooks Range, prefers moist tussock meadows in wide alpine valleys, often surrounding lakes. In central Alaska prefers dry ridgetop tundra (Kessel and Gibson 1978). Elsewhere found at treeline. May be found in low areas of tundra interspersed with spruce.

During winter this species is gregarious and can be one of the most common grassland birds in north-central and northeastern Oklahoma (Grzybowski 1982, Dunn and Dunn 1999) where it specializes in using specific heavily grazed fields of short grasses, mostly silver beardgrass (*Andropogon saccharoides*) interspersed with three awn

grass (*Aristida* sp., Grzybowski 1983, Dunn and Dunn 1999). Favored fields appear to have some patches of tall grasses mixed among the patches of shorter grass typically used by birds foraging on the ground (Dunn and Dunn 1999). The species is commonly found near airports, pastures, and regularly cut hayfields, sometimes near lakes, streams, or damp areas (Briskie 1993, Dunn and Dunn 1999).

E. Identify threats or concerns associated with key habitats

No immediate threats to breeding habitats used in Alaska. Some concerns in Alaska include:

- Changes in the distribution and condition of favored breeding habitat, such as drying of alpine meadows and advance of treeline, resulting from climate change.
- Accumulation of persistent organic pollutants a concern across breeding range.

Threat primarily on wintering grounds where the species is concentrated within a small portion of the southern Great Plains where favored grasslands are heavily managed for agricultural uses.

F. Goal: Ensure Smith's Longspur populations are viable within natural variation throughout their distribution in Alaska.

G. Develop objectives, etc., for Conservation and Management Needs

State conservation and management needs:

Objective: Maintain species widely distributed across the current range and within 20% of current population size in Alaska.

Target: Stable geographic breeding distribution and population trend in Alaska.

Measure: Distribution and population trend estimated from periodic surveys of breeding birds.

Issues: Low breeding densities, patchy distribution, and difficulty in surveying populations using existing broad-scale monitoring programs limits the ability to manage and conserve Alaska populations of this species (BPIF 1999). Monitoring surveys will likely need to be designed specifically for this species to overcome these obstacles. General lack of specific information on the breeding distribution and habitat associations in Alaska severely hampers the ability to design effective surveys for this species.

Conservations actions:

- a. A high priority is to extend the systematic-random inventory of montane-nesting birds conducted in the Brooks Range (R. E. Gill, Jr. unpublished data) eastward into the Arctic National Wildlife Refuge. This would be an important inventory to enumerate population size in northern Alaska and identify important geographic locations and habitats for this species in Alaska. This survey should be completed by 2006 so as to be directly comparable to similar data already collected in the western Brooks Range (R. E. Gill, Jr. unpublished data).
- b. Once these surveys are completed, conduct a thorough evaluation of the breeding distribution and habitat use of this species in Alaska based on the Brooks Range inventory, information from Kessel and Gibson (1978), and other standardized surveys conducted as part of the North American Breeding Bird Survey, Alaska Off-road Breeding Bird Survey (Handel 2000), Alaska Landbird Monitoring Survey, and other intensive inventories of birds (Swanson and Nigro 2003) within the species breeding range. Observations of Smith's Longspurs from these surveys should be examined to assess the relative importance of different geographic areas and habitats in supporting breeding population of this species with the results used to develop objectives for conserving breeding areas for this species.
- c. Develop methods for monitoring changes in population size either through intensive local studies in areas with predictable concentrations, or through extensive surveys of key habitats across representative parts of the breeding range in Alaska (i.e., eastern Brooks Range). Information on distribution and habitat use will undoubtedly help the design of such surveys. Consider resampling existing surveys (i.e., eastern Brooks Range) when appropriate.
- d. Conduct demographic studies in areas with high concentrations of this species to collect baseline information on annual survival and reproductive success and identify factors effecting reproduction. Compare such information to similar data collected from breeding populations in Churchill and possibly use data from both Churchill and Alaska to model how deficits in survival, reproduction, or

recruitment are likely to effect rates of population growth.

Issue: Potential accumulation of persistent organic pollutants (POPs) a concern across breeding range.

Conservations action:

- e. Conduct assessment of exposure to POPs in breeding range.

Global conservation and management needs:

Objective: Maintain species widely distributed across the global breeding and wintering range at population sizes within the range of natural cycles.

Target: Stable geographic breeding distribution and population trend.

Measure: Distribution and population trend estimated from periodic surveys of breeding and / or wintering birds.

Issue: Species has extremely limited wintering range in the southern Great Plain centered in Oklahoma. This area is heavily managed for livestock and agriculture with much land under private ownership.

Conservation action:

- a. Increase the amount of grassland area in preserves in key wintering areas.
- b. Encourage the development of land management policies and practices in wintering areas that protect and enhance habitats for Smith's Longspurs, particularly on private lands.

Issue: Current surveys of birds on wintering areas may already be monitoring population trends for this species. However, these data have not been sufficiently evaluated.

Conservations actions:

- c. Evaluate data from the Christmas Bird Count to determine if this survey is already adequate for monitoring changes in distribution and population size of Smith's Longspurs on wintering grounds. Data from this survey already go back continuously to the early 1950's so this survey may already be tracking gross changes in population size.
- d. Develop and test winter surveys for monitoring changes in population size if the Christmas Bird Count is proven inadequate in monitoring trends.

Issue: Species has small population size and occurs both in the United States and Canada.

Conservation action:

- e. Improve communication among Alaskan and Canadian biologists, conservationists, land managers, and policy makers and develop long-term plans for the conservation of this species across its limited range.
- f. A priority within this should be to conduct literature reviews or studies to assess threats to birds across entire breeding and non-breeding range. An assessment of threats on the wintering range should undertaken first as distribution is limited to areas that are intensively managed.

H. Propose plan & time frames for monitoring species and their habitats

Surveys in Alaska should be coordinated between key conservation units (i.e., U.S. Fish and Wildlife Service's Arctic National Wildlife Refuge, National Park Service's Central and Northern Park complexes), appropriate research (i.e., U.S. Geological Survey's Alaska Science Center) and conservation (i.e., U.S. Fish and Wildlife Service's Migratory Bird Management) agencies.

Coordination of range-wide conservation of this species will need to be coordinated among several federal, provincial, state, and non-governmental agencies; notably the U.S. Fish and Wildlife Service (Regions 2, 3, 4, 6, 7), the Canadian Wildlife Service, U.S. Geological Survey, Fish and Game (Alaska, Arkansas, Kansas, Oklahoma, Texas), and appropriate Universities and non-governmental agencies (Bird Studies Canada, Boreal Songbird Initiative, Sutton Avian Research Center). Evaluations of trend data from the Christmas Bird Count may include National Audubon Society and the U.S. Geological Survey's Patuxent Wildlife Research Center among others.

I. Recommend time frame for reviewing and revising the Strategy

Ten years unless evaluation of distribution in Alaska or estimates of population trend from the Christmas Bird Count or other surveys suggest populations may be in decline.

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Landbirds sensitive to forest management

A. Species Group description

Common name: Landbird species sensitive to forest management. This section includes the following landbirds that are associated with mature forest conditions in boreal and coastal forests in Alaska and have been shown to be sensitive to forest management practices such as timber harvest, fire suppression, and salvage harvest.

Upland gamebirds

Blue Grouse, *Dendragapus obscurus*

Prince of Wales Spruce Grouse, *Falcapennis canadensis isleibi*

Canopy-nesting species

Pacific-slope Flycatcher, *Empidonax difficilis*

Red Crossbill, *Loxia curvirostra*

Golden-crowned Kinglet, *Regulus satrapa*

White-winged Crossbill, *Loxia leucoptera*

Varied Thrush, *Ixoreus naevius*

Pine Siskin, *Carduelis pinus*

Townsend's Warbler, *Dendroica townsendi*

Cavity-nesting species

Red-breasted Sapsucker, *Sphyrapicus ruber*

Chestnut-backed Chickadee, *Poecile rufescens*

Hairy Woodpecker, *Picoides villosus*

Boreal Chickadee, *Poecile hudsonica*

Am. Three-toed Woodpecker, *Picoides tridactylus*

Red-breasted Nuthatch, *Sitta canadensis*

Black-backed Woodpecker, *Picoides arcticus*

Brown Creeper, *Certhia americana*

Northern Flicker, *Colaptes auratus*

B. Distribution and abundance

Range:

Alaska range comments: Forested regions of the state including both coastal and boreal forests. Resident species typically undergo some limited seasonal movements within Alaska.

Endemic taxa: Prince of Wales Spruce Grouse.

Resident species: Blue Grouse, Red-breasted Sapsucker, *Picoides* woodpeckers, chickadees, Red-breasted Nuthatch, Brown Creeper, Golden-crowned Kinglet, Red Crossbill, White-winged Crossbill, Pine Siskin

Short-distance migrants (within N. America): Northern Flicker, Varied Thrush

Long-distance migrants (winter in Neotropics): Pacific-slope Flycatcher, Townsend's Warbler

Abundance:

Global abundance comments: Population estimates (expressed as number of individuals) from Rich et al. (2004).

Blue Grouse: 2,600,000

Boreal Chickadee: 7,800,000

Prince of Wales Spruce Grouse: n/a

Red-breasted Nuthatch: 18,000,000

Red-breasted Sapsucker: 2,500,000

Brown Creeper: 5,400,000

Hairy Woodpecker: 9,400,000

Golden-crowned Kinglet: 34,000,000

American Three-toed Woodpecker: 830,000

Varied Thrush: 26,000,000

Black-backed Woodpecker: 1,300,000

Townsend's Warbler: 12,000,000

Northern Flicker: 16,000,000

Red Crossbill: 15,000,000

Pacific-slope Flycatcher: 8,300,000

White-winged Crossbill: 41,000,000

Chestnut-backed Chickadee: 6,900,000

Pine Siskin: 22,000,000

State abundance comments: Population estimates, expressed as number of individuals (% global population) from Rosenberg (2004). Note that the Rosenberg (2004) estimates are suspected to be inaccurate, but provide the best available estimates of statewide populations.

Blue Grouse: 590,000 (23%)

Boreal Chickadee: 2,223,000 (29%)

Prince of Wales Spruce Grouse: n/a¹

Red-breasted Nuthatch: 180,000 (1%)

Red-breasted Sapsucker: 800,000 (32%)

Brown Creeper: 350,000 (6%)

Hairy Woodpecker: 340,000 (4%)

Golden-crowned Kinglet: 2,800,000 (8%)

Am. Three-toed Woodpecker: 250,000 (30%)

Varied Thrush: 15,000,000 (58%)

Black-backed Woodpecker: n/a

Townsend's Warbler: 4,100,000 (34%)

Northern Flicker: 220,000 (1%)

Red Crossbill: 810,000 (5%)

Pacific-slope Flycatcher: 1,700,000 (20%)

White-winged Crossbill: 2,340,000 (6%)

Chestnut-backed Chickadee: 1,700,000 (25%)

Pine Siskin: 1,500,000 (7%)

Trends:

Global trends: Population trends (% change per year) calculated from data (1980-2003) from the North American Breeding Bird Survey (Sauer et al. 2004); *n* = number or routes trend is based on.

Blue Grouse: -1.8% ($P < 0.01$, $n = 81$)	Boreal Chickadee: -1.9% ($P = 0.18$, $n = 135$)
Prince of Wales Spruce Grouse: n/a ¹	Red-breasted Nuthatch: 1.2% ($P < 0.01$, $n = 1055$)
Red-breasted Sapsucker: unknown	Brown Creeper: -0.9% ($P = 0.32$, $n = 539$)
Hairy Woodpecker: 1.1% ($P < 0.01$, $n = 1975$)	Golden-crowned Kinglet: -1.1% ($P = 0.09$, $n = 635$)
Am. Three-toed Woodpecker: -3.1% ($P = 0.64$, $n = 31$)	Varied Thrush: -1.0% ($P = 0.07$, $n = 186$)
Black-backed Woodpecker: -7.2% ($P = 0.01$, $n = 67$)	Townsend's Warbler: 0.9% ($P = 0.18$, $n = 189$)
Northern Flicker: n/a	Red Crossbill: -2.3% ($P < 0.01$, $n = 413$)
Pacific-slope Flycatcher: n/a	White-winged Crossbill: -1.2% ($P = 0.80$, $n = 113$)
Chestnut-backed Chickadee: -0.7% ($P = 0.31$, $n = 178$)	Pine Siskin: -3.3% ($P < 0.01$, $n = 791$)

State trends: Population trends (% change per year) calculated from data (1980-2003) from the North American Breeding Bird Survey (Sauer et al. 2004); *n* = number or routes trend is based on.

Blue Grouse: 0.0% ($P = 1.00$, $n = 10$)	Boreal Chickadee: -0.5% ($P = 0.80$, $n = 43$)
Prince of Wales Spruce Grouse: n/a ¹	Red-breasted Nuthatch: -0.6% ($P = 0.82$, $n = 17$)
Red-breasted Sapsucker: 1.9% ($P = 0.50$, $n = 16$)	Brown Creeper: 22.3% ($P = 0.20$, $n = 14$)
Hairy Woodpecker: 6.8% ($P = 0.05$, $n = 28$)	Golden-crowned Kinglet: -0.5% ($P = 0.83$, $n = 31$)
Am. Three-toed Woodpecker: 6.5% ($P = 0.33$, $n = 16$)	Varied Thrush: -0.1% ($P = 0.89$, $n = 85$)
Black-backed Woodpecker: n/a	Townsend's Warbler: 0.2% ($P = 0.93$, $n = 35$)
Northern Flicker: 0.2% ($P = 0.95$, $n = 34$)	Red Crossbill: 3.8% ($P = 0.04$, $n = 15$)
Pacific-slope Flycatcher: 1.3% ($P = 0.61$, $n = 16$)	White-winged Crossbill: 4.3% ($P = 0.30$, $n = 47$)
Chestnut-backed Chickadee: 2.0% ($P = 0.41$, $n = 20$)	Pine Siskin: 5.5% ($P = 0.10$, $n = 41$)

¹No direct information is available on population trends of Prince of Wales Spruce Grouse; however, this species is likely to have been reduced in numbers due to the combination of large-scale timber harvest and introductions of marten on islands used by this bird.

C. Problems, issues, or concerns for species (or species group)

All of these species are sensitive to losses of mature coniferous forest throughout their ranges in Alaska. Timber and salvage harvest and associated road construction in Alaska not only decrease forest cover, but also alters or eliminates attributes of forest structure, composition, configuration, and connectivity needed by populations of these birds. Many of the important habitat attributes in mature stands that are needed by these species are not recruited into harvested stands for more than 100 years, such as snags and dead wood material on live trees (e.g., broken tree tops) for cavity-nesting birds (Sallabanks et al. 2001). Harvest prescriptions are sometimes applied during timber removal to minimize the negative effects of logging (such as riparian buffers) most often on federal lands, but their efficacy in maintaining populations of forest dwelling birds across landscapes is both questionable and poorly evaluated. Forest prescriptions that protect important resources such as patches of large diameter trees, riparian corridors, and snags, are likely to be most beneficial to these birds. Post harvest prescriptions such as planting, herbicide application, and thinning are sometimes used to increase commercial tree growth but have unknown consequences on forest-associated birds.

In southeast Alaska these bird species are typically found more commonly in high volume old-growth forests of hemlock-spruce at lower elevations than second-growth stands of varying ages following clearcutting (Kessler and Kogut 1985, Zwickel 1992, DellaSala et al. 1996, Russell 1999, Kissling 2003, Andres et al. in press). Large-scale natural disturbance is largely absent from these coastal forests, thus widespread disturbance from logging is typically detrimental to these birds. Of particular concern among this group of birds is the Prince of Wales Spruce Grouse which is endemic Prince of Wales and nearby islands in southern southeast Alaska (Dickerman and Gustafson 1996) and has a very small population which has likely be reduced in numbers from widespread timber harvest and introductions of marten across its range.

Many of these species whose breeding ranges extend into the boreal forest, such as the Brown Creeper, Golden-crowned Kinglet, Varied Thrush, and Townsend's Warbler, are also associated with mature white spruce or mixed white spruce/paper birch forests for breeding (Spindler and Kessel 1980, Matsuoka et al. 1997 a and b) and therefore decrease in density following removal of the large trees from fires, outbreaks of bark beetles, and associated salvage logging (Quinlan 1978, Lance and Howell 2000, Collins et al. 2001). Other species, such as Hairy, American Three-toed, and Black-backed woodpeckers; however, increase in abundance during beetle outbreaks (Lance and Howell 2000) or immediately following fires (Hutto 1995, Murphy and Lehnhausen 1998), but salvage logging eliminates

resources needed by these birds (Hutto 1995). Because the boreal forest is the home to frequent and large-scale natural disturbances from fires and insect outbreaks, silvicultural systems that mimic natural disturbances may be promising, but require development.

Recent research suggests that changes in climate may be having large-scale effects on our forests in Alaska. Warming trends have favored reproduction of spruce beetles, (*Dendroctonus rufipennis*) and larch sawflies (*Pristiphora erichsonii*) leading to unprecedented outbreaks in the last decade and low snowfall may be causing widespread mortality among yellow cedar in southeast Alaska. Similarly the frequency of large-scale fires and wind storms may increase with continued changes in climate. The effects of these forest disturbances and associated salvage logging activities on bird communities are largely unknown and need further study, particularly considering current projections of climate changes in Alaska.

Unfortunately, biologists and land managers generally lack information regarding habitat requirements for these species, and are thus unable to provide effective strategies for conserving or restoring important avian habitats or habitat attributes. Knowledge of the specific components of forest structure (vertical and horizontal), composition, and configuration required by these species would allow land managers to make better decisions regarding harvest prescriptions, rotations periods, second-growth management, fire management, and habitat restoration and ultimately lead to more effective avian conservation. Results from research in this area must be put into the hands of managers as soon as possible so that findings can be incorporated into the planning process.

D. Identify location and condition of key or important habitat areas

Key coastal forest habitats include low elevation, mid- and high-volume conifer forests of uneven age structure. Condition of these habitats varies from very degraded to pristine, and is related to the intensity of land management. Many private and state owned lands in southeast Alaska, Prince William Sound, and the Kodiak Archipelago are degraded as a result of logging, mining, and associated road construction. In southeast Alaska forests on Prince of Wales, Heceta, northeast Chichagof, Kupreanof, and Kuiu islands are particularly degraded from extensive clearcut logging. Despite large-scale industrial logging in the region, Alaska supports more than ¼ of the Earth's coastal temperate rainforest and maintains the largest and most pristine tracts left in the world (DellaSala et al. 2001). However, pristine coastal forests in southeast Alaska are generally restricted in designated parks and monuments, including Admiralty Island National Monument, Misty Fjords National Monument, Glacier Bay National Park and Preserve, and several federally designated wilderness areas within the Tongass National Forest.

Critical interior forest habitat includes mature forests of upland and riparian white spruce and mixed white spruce and variable deciduous species. Similar to coastal forests, interior forest condition is largely related to land ownership. Large tracts of state and private land on the Kenai Peninsula are highly degraded due to salvage logging. Small amounts of logging have also occurred in the Tanana State Forest and the Native lands in the Copper River Basin, leaving these areas somewhat degraded as well. Additionally, interior forests have been fragmented locally from urban and industrial development (e.g., oil and gas). However, the majority of the boreal forest in Alaska is still largely pristine. In the Canadian boreal, forests are quickly being lost to forestry, petroleum, agricultural, and urban development.

E. Identify threats or concerns associated with key habitats

See C and D above.

F. Goal: Ensure populations of species sensitive to forest management are viable within natural variation throughout their distribution in Alaska.

G. Develop objectives, etc., for Conservation and Management Needs

State conservation and management needs:

Objective: Maintain species widely distributed across their current range and within 20% of current population size.

Target 1: Stable geographic breeding distribution and population trend.

Measure 1: Distribution and trends in abundance relative to habitat estimated from the statewide North American Breeding Bird Survey (BBS) and Alaska Landbird Monitoring Survey (ALMS).

Issue: Broad-scale monitoring using the BBS and ALMS program may not meet the information needs for geographic areas that are undergoing rapid and widespread reductions in forest cover. In particular more specific information is needed on the long-term effects of timber harvest, fire, insect outbreaks, salvage harvest, and associated pre- and post harvest prescriptions on bird populations.

Conservation action:

- a. Develop inventories and/or simulation models to assess the short-term effects of landscape change on bird communities in areas undergoing rapid and widespread changes in forest cover. This is particularly needed for the Prince of Wales Spruce Grouse because of widespread harvest throughout the restricted range of this bird.
- b. Monitor successional trajectories of bird communities to evaluate the long-term effects of forest change. Priority should be placed on evaluating pre- and post-harvest activities applied to promote wildlife populations (i.e., variable retention, buffers, reforestation, second-growth thinning). Whenever possible use such data to develop empirical and/or simulation models to assess both current and future benefits of such prescriptions.

Issue: The distribution and population status of the Prince of Wales Spruce Grouse warrants additional assessment as this bird is endemic to a small number of islands in southern southeast Alaska that have been intensively managed through timber harvest and introductions of marten.

Conservation action:

- c. Conduct surveys to assess population size, densities, and distribution of this subspecies to assess vulnerability to extinction and identify important areas and habitats for conservation.
- d. Conduct phylogenetic studies to assess the degree of isolation of this subspecies from other nearby populations of Spruce Grouse. Such information will help determine how limitations in dispersal may exacerbate threats from timber harvest.

Issue: General poor information on distribution, population size, and particularly trends.

Conservation action:

- e. Maintain current participation in the roadside BBS and complement information from this program by fully implement the ALMS program in Alaska. The later will require broad participation among federal, state, and private land managers in Alaska.

Issue: Early breeding species (e.g., Blue Grouse, woodpeckers), species occurring naturally at low densities (e.g., woodpeckers), species with low detectability (e.g., Brown Creeper), and taxa with restricted ranges (e.g., Prince of Wales Spruce Grouse) may not be adequately monitored by existing survey programs (i.e., BBS and ALMS).

Conservation action:

- f. Develop survey and monitoring protocols for early breeding species and those with low detectability and/or low densities.

Target 2: Maintain amount of appropriate habitat needed to support species across current range and within 20% of current population size.

Measure 2: Quantify the amount and distribution of appropriate forest habitat. Changes in forest cover should be monitored grossly by compiling information on forest area harvested and restored in Alaska through existing sources of information. More specific changes in forest structure, cover, and composition should be monitored preferably state-wide, but at a minimum in areas with high rates of change, using remote sensing at 10-year intervals.

Issue: Limited information on the appropriate types, amounts, and configurations of forest habitat needed by these species hinders the evaluation of planned harvest activities and the development of habitat targets (Target 2) that will help achieve numerical goals for bird populations (Target 1; Rosenberg 2004 a and b). In particular information on habitats important in supporting high survival or reproductive success are lacking.

Conservation actions:

- g. Compile and review existing information on habitat use and natural history requirements for these birds to identify important habitats and develop general habitat targets.
- h. Develop more specific habitat selection models for birds in geographic areas that are undergoing rapid change. When possible use existing regional GIS data on forest cover (i.e., southeast Alaska and

- Kenai Peninsula) in combination with existing data from bird surveys (BBS, ALMS, and other surveys) to develop more specific habitat targets.
- i. For species that are highly restricted to mature forests, specific research should be conducted to identify habitats, habitat attributes, and geographic areas associated with high reproduction success and survival. Such information would give insight into the mechanisms governing avian responses to habitat manipulations and would provide an improved basis for developing habitat targets and recommendations for forest management.
 - j. Provide information from these efforts to managers as soon as possible so that findings can be incorporated into the planning process.

Issue: Existing information on timber harvest and forest restoration in Alaska is not compiled in order to assess how changes in forest cover may be effecting bird populations.

Conservation action:

- k. Monitor gross changes in forest cover by compiling information on timber and salvage harvest and forest restoration activities in Alaska from the USDA Forest Service, Alaska Division of Forestry, and other appropriate sources on an annual or biennial basis.

Issue: Lack of detailed information on forest cover, structure, and composition for Alaska, particularly on state and private lands. However, detailed data are currently available for specific areas such as the Tongass National Forest, Kenai Peninsula, and a growing number of National Parks.

Conservation action:

- l. Develop a statewide landcover map for Alaska that includes data layers for forest structure and species composition at a minimum resolution of 30 meters.

Issue: Lack of implementation of prescriptions or best management practices on some federal, state, and private lands.

Conservation action:

- m. Develop products that describe best management practices for bird conservation.
- n. Encourage federal, state, and private landowners to implement best management practices. When possible, advocate legislation to require use of best management practices on these lands. Also landbird issues should be brought more directly into the forest management planning process.

H. Propose plan & time frames for monitoring species and their habitats

BBS work is ongoing in Alaska through cooperative interagency efforts and a network of volunteers. Presently, the ALMS program has not been fully implemented statewide and remains unfunded. Development of a statewide landcover map is unfunded, and responsibility for this task does not belong to a particular agency or private organization. Studies of demography, habitat selection, and effectiveness monitoring are also unfunded at this time. Participants should include U.S. Geological Survey, U.S. Fish and Wildlife Service, National Park Service, Department of Defense, U.S. Forest Service, and Bureau of Land Management, State of Alaska, Non-governmental organizations, universities, and private landowners.

I. Recommend time frame for reviewing and revising the Strategy

Ten years unless monitoring suggests that population(s) have fallen below target levels.

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Landbirds with long-term declines in populations size

A. Species Group description:

This group includes Alaska landbird taxa experiencing significant ($P < 0.15$) long-term declines ($\geq 1.5\%$ population decline per year for 10 years or more) in their breeding range, including or excluding Alaska. This template is meant to generally address the conservation of Alaskan landbirds with documented declines, but also accommodates species which are later found to have declines within the next 10 years. Monitoring of landbird populations in Alaska largely began in the early to mid 1990s, thus documented declines are largely restricted to species that are still currently abundant and experience moderate declines or more uncommon species experiencing dramatic reductions in population size.

In this account we focus on three classes of declining species. First are species that are declining in most of their range, but declines in Alaska are unsubstantiated (Sauer et al. 2004). This group includes several species including Blue Grouse, Black Swift, and Rufous Hummingbird which are on the Partners in Flight Continental Plan Watch List (Rich et al. 2004). Second are species that are still common but are showing evidence of declines in Alaska, but not always across their broader breeding ranges in North America. Violet-green Swallow, Hermit Thrush, and White-crowned Sparrow are examples of such species (Sauer et al. 2004). Additionally species with documented low rates of survival or productivity either statewide or across large regions of the state, such as Wilson's Warblers in upper Cook Inlet Alaska (DeSante et al. 2003), are included here.

Finally we have developed individual species accounts for landbirds with severe long-term declines throughout their range, including Alaska because these species are of paramount concern. This group includes Blackpoll Warbler, Olive-sided Flycatcher, and Rusty Blackbird. All further details on these birds are included in the individual species accounts on separate 'templates.'

Common/Scientific names: Alaskan landbirds experiencing long-term declines

Widespread declines (but not in Alaska)

Blue Grouse, *Dendragapus obscurus*

Black Swift, *Cypseloides niger*

Rufous Hummingbird, *Selasphorus rufus*

Belted Kingfisher, *Ceryle alcyon*

Black-backed Woodpecker, *Picoides arcticus*

Bank Swallow, *Riparia riparia*

Barn Swallow, *Hirundo rustica*

Wilson's Warbler, *Wilsonia pusilla*

Dark-eyed Junco, *Junco hyemalis*

Widespread declines (but not in Alaska)

Pine Grosbeak, *Pinicola enucleator*

Red Crossbill, *Loxia curvirostra*

Pine Siskin, *Carduelis pinus*

Declines in Alaska (but not range-wide)

Violet-green Swallow, *Tachycineta thalassina*

Cliff Swallow, *Petrochelidon pyrrhonota*

Hermit Thrush, *Catharus guttatus*

White-crowned Sparrow, *Zonotrichia leucophrys*

B. Distribution and abundance

Range:

Global and state range comments: variable by species.

Abundance:

Global abundance comments: population estimates (expressed as number of individuals) from Rich et al. (2004).

Widespread declines (but not in Alaska)

Blue Grouse: 2,600,000

Black Swift: 150,000

Rufous Hummingbird: 6,500,000

Belted Kingfisher: 2,200,000

Black-backed Woodpecker: 1,300,000

Bank Swallow: 46,000,000

Barn Swallow: 190,000,000

Wilson's Warbler: 36,000,000

Dark-eyed Junco: 260,000,000

Widespread declines (but not in Alaska)

Pine Grosbeak: 4,400,000

Red Crossbill: 15,000,000

Pine Siskin: 22,000,000

Declines in Alaska (but not range-wide)

Violet-green Swallow: 11,000,000

Cliff Swallow: 89,000,000

Hermit Thrush: 56,000,000

White-crowned Sparrow: 72,000,000

State abundance comments: Estimates of populations size (% global population in Alaska) from Rosenberg (2004 a and b) are expected to be inaccurate, but provide the only available estimates of statewide population size.

Widespread declines

Blue Grouse: 590,000 (23%)
Black Swift: n/a
Rufous Hummingbird: 1,100,000 (17%)
Belted Kingfisher: 250,000 (11%)
Black-backed Woodpecker: n/a
Bank Swallow: 4,500,000 (10%)
Barn Swallow: 100,000 (<1%)
Wilson’s Warbler: 17,500,000 (48%)
Dark-eyed Junco: 47,200,000 (18%)

Widespread declines (but not in Alaska)

Pine Grosbeak: 320,000 (7%)
Red Crossbill: 810,000 (5%)
Pine Siskin: 1,500,000 (7%)

Declines in Alaska

Violet-green Swallow: 1,200,000 (11%)
Cliff Swallow: 1,800,000 (2%)
Hermit Thrush: 5,800,000 (10%)
White-crowned Sparrow: 21,900,000 (31%)

Trends:

Global trends: Population trends (% change per year) calculated from data (1980-2002) from the North American Breeding Bird Survey (Sauer et al. 2003); *n* = number of routes.

Blue Grouse: -1.8% (<i>P</i> = 0.01, <i>n</i> = 81)	Pine Grosbeak: -6.7% (<i>P</i> = 0.01, <i>n</i> = 79)
Black Swift: -7.1% (<i>P</i> = 0.05, <i>n</i> = 43)	Red Crossbill: -2.3% (<i>P</i> < 0.01, <i>n</i> = 413)
Rufous Hummingbird: -2.3% (<i>P</i> = 0.01, <i>n</i> = 201)	Pine Siskin: -3.3 (<i>P</i> < 0.01, <i>n</i> = 791)
Belted Kingfisher: -1.6% (<i>P</i> < 0.01, <i>n</i> = 1754)	
Black-backed Woodpecker: -7.2% (<i>P</i> = 0.01, <i>n</i> = 67)	Violet-green Swallow: 0.8% (<i>P</i> = 0.28, <i>n</i> = 623)
Bank Swallow: -1.9% (<i>P</i> = 0.05, <i>n</i> = 947)	Cliff Swallow: 0.5% (<i>P</i> = 0.36, <i>n</i> = 1841)
Barn Swallow: -2.1 (<i>P</i> < 0.01, <i>n</i> = 3275)	Hermit Thrush: 0.9% (<i>P</i> < 0.01, <i>n</i> = 1040)
Wilson’s Warbler: -2.5% (<i>P</i> < 0.01, <i>n</i> = 456)	White-crowned Sparrow: -0.1% (<i>P</i> = 0.95, <i>n</i> = 297)
Dark-eyed Junco: -2.0% (<i>P</i> < 0.01, <i>n</i> = 1051)	

State trends: Population trends (% change per year) calculated from data (1980-2002) from the North American Breeding Bird Survey in Alaska (Sauer et al. 2003); *n* = number of routes.

Blue Grouse: 0.0% (<i>P</i> = 1.00, <i>n</i> = 10)	Pine Grosbeak: 3.3% (<i>P</i> = 0.25, <i>n</i> = 35)
Black Swift: n/a	Red Crossbill: 3.8% (<i>P</i> = 0.04, <i>n</i> = 15)
Rufous Hummingbird: 3.9% (<i>P</i> = 0.33, <i>n</i> = 17)	Pine Siskin: 5.5% (<i>P</i> = 0.10, <i>n</i> = 41)
Belted Kingfisher: -2.5% (<i>P</i> = 0.32, <i>n</i> = 32)	
Black-backed Woodpecker: n/a	Violet-green Swallow: -5.1% (<i>P</i> = 0.01, <i>n</i> = 37)
Bank Swallow: 4.1% (<i>P</i> = 0.05, <i>n</i> = 38)	Cliff Swallow: -6.0% (<i>P</i> = 0.09, <i>n</i> = 30)
Barn Swallow: 0.9% (<i>P</i> = 0.89, <i>n</i> = 10)	Hermit Thrush: -1.8% (<i>P</i> = 0.06, <i>n</i> = 65)
Wilson’s Warbler: 1.0% (<i>P</i> = 0.37, <i>n</i> = 77);	White-crowned Sparrow: -1.9% (<i>P</i> = 0.02, <i>n</i> = 73)
Dark-eyed Junco: -1.1% (<i>P</i> = 0.06, <i>n</i> = 80)	

C. Problems, issues, or concerns for species (or species group)

All of these species are showing signs of population decline either in Alaska or significant portions of their breeding range outside of Alaska. Although many of these species are still common, at least regionally, we currently have little insight into whether these declines are part of natural population cycles or larger ecological problems. Research and conservation efforts are needed to identify the causes of declines and stabilize their populations before they become rare and their functional roles in terrestrial ecosystems in Alaska are lost. These declines warrant further investigation also because they may be indicative of larger ecosystemic problems either in Alaska or those in other parts of these species’ ranges.

Because monitoring programs for landbirds in Alaska were not widely instituted until the early 1990’s, many of these declines have not been documented until very recently. Few biologist and resource managers are aware of these declines in Alaska and thus these species have received little to no recognition in the conservation planning process in the state.

D. Identify location and condition of key or important habitat areas

Habitats used by these birds vary widely among species.

E. Identify threats or concerns associated with key habitats

Variable by species.

F. Goal: Ensure populations are viable within natural variation throughout their distribution in Alaska.

G. Develop objectives, etc., for Conservation and Management Needs

State of Alaska conservation and management needs:

Objective 1: At a minimum, maintain species appropriately distributed across their current range at population sizes within the range of natural cycles. However, it may be more appropriate to increase population size to 1966 levels for species declining over large parts of their range (i.e., PIF Continental Watch List Species listed in Rich et al. 2004).

Target: Increasing breeding distributions and population trends.

Measure: Population trends estimated jointly from the North American Breeding Bird Survey (BBS) in Alaska and its complementary program in roadless areas of the state, the Alaska Landbird Monitoring Survey (ALMS).

Issue: Causes of population declines are rarely known.

Conservation actions:

- a. Raise profile of demise of these species to pique interest in the research community for exploring causes of declines.
- b. Conduct targeted demographic studies to identify deficits in survival, reproduction, or recruitment and whether such deficits are linked with specific habitats, management actions, habitat changes, geographic locations, exposure to contaminants, diseases, or natural cycles. Priority should be places on studying suites of species that share habitats during critical times of the year.
- c. Based on research findings, develop and implement conservation strategies in appropriate areas to reverse population decline.

Issue: There is a general lack of understanding of the breeding habitat requirements of these species in Alaska. Thus it is difficult to conserve or enhance important areas to help meet the objective or restoring populations to 1980's levels.

Conservation actions:

- d. Conduct field studies and/or analyses of existing data to determine habitats, habitat attributes, and geographic locations that support high densities of this species during breeding and migration in Alaska. Determine if declines in habitat may be linked to declines in population size. Combine such studies with conservation action "b" when possible.
- e. Use results from such studies to direct research to important areas and strategically protect or enhance important areas and habitats to help meet the objective of restoring populations to 1980's levels (Rosenberg 2004 a and b).
- f. Communicate the habitat needs of these species to appropriate land managers and regulatory agencies in Alaska.

Issue: Ability to maintain long-term monitoring of BBS routes in appropriate places in the state.

Conservation actions:

- g. Maintain current participation in the BBS in Alaska at a minimum.

Issue: Current knowledge of population trends is based solely on the roadside BBS which only samples a small proportion of the species breeding range in Alaska. Therefore it may be inappropriate to extend the objective for this species to outside of the BBS corridor without an appropriate evaluation of its status in roadless areas.

Conservation actions:

- h. Examine independent data on trends from migration stations, other breeding surveys, and demographic monitoring to determine if declines are evident in areas away from the road system.
- i. Encourage and implement full participation in the Alaska Landbird Monitoring Survey (ALMS), whose random sampling of roadless areas will improve estimates of population size and percent global population in Alaska, reduce bias in trends associated with geographic limited BBS, improve knowledge or distribution and, when combined with data from the BBS, increase statistical power in detecting statewide trends. Surveys should be run for no less than 25 years.

Issue: For some species such as Black Swift, even full implementation of the BBS and ALMS will be insufficient to determine population status and trends due to the species unique ecology and the sampling

parameters of the two programs.

Conservation Actions:

- j. Conduct field studies as appropriate to determine habitats and geographic locations of these species in Alaska.
- k. Develop protocols that adequately sample populations of these species.

Issue: Wilson's Warbler has been found to have low rates of survival and productivity in upper Cook Inlet suggesting regional problems with the status of this species (DeSante et al. 2003).

Conservation actions:

- l. Determine if species has different population trajectory in south-central Alaska compared to other regions in the state. If so, identify cause of the regional decline and develop strategies to remediate the problem.

Global conservation and management needs:

Global Objective: Reverse population declines.

Target: At a minimum, maintain still common species (i.e., Dark-eyed Junco) appropriately distributed across their current range at population sizes within the range of natural cycles. For PIF Continental Watch List increase population size to 1966 levels (Rich et al. 2004).

Measure: Breeding Bird Survey and Christmas Bird Count (CBC).

Issue: Cause(s) of decline is/are unknown

Conservations actions:

- m. Collaborate with researchers and conservationists in appropriate locations in North and South America to identify the cause(s) of decline, and develop and implement strategies for remediating the problem(s) once identified (Rich et al. 2004).

Issue: Much coordination will be needed among states, provinces, and agencies to develop and implement strategies to reverse declines across the ranges of these species.

Conservations actions:

- n. Develop numerical goals for conservation (i.e., amount of habitats for restoration) appropriately for each state and province included in the species range and implement strategies for reaching these goals for each area (Rich et al. 2004).

Issue: Poor recognition of population decline among public, academic, and conservation communities.

Conservation action:

- o. Develop and distribute information about the decline to the public, academic, and conservation communities.

H. Propose plan & time frames for monitoring species and their habitats

Monitoring by BBS and ALMS should be conducted annually from present for a minimum of twenty-five years. Studies of demography and habitat requirements should begin as soon as possible and continue for a minimum of five years. BBS work is underway in Alaska through cooperative interagency efforts and a network of volunteers. At this point the ALMS, demography, and nesting habitat studies are unfunded; participants should include USGS, USFWS, NPS, BLM, USFS, DOD, State of Alaska, NGOs, universities, and private landowners, including, but not restricted to Native corporations and industry.

I. Recommend time frame for reviewing and revising the Strategy

Five-year intervals for review.

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A landbird in decline: the Olive-sided Flycatcher

A. Species description [or Species Group description]

Common name: Olive-sided Flycatcher

Scientific name: *Contopus cooperi*

B. Distribution and abundance

Range:

Global range comments: Breeding range extends from Alaska east through coniferous forests to southern Labrador, in the Northeast south to Massachusetts and locally to North Carolina, in the Midwest south to northern Wisconsin and northeastern Ohio, and in the West south along coastal ranges to Baja California and in the Rockies to southeastern Arizona and western Texas (Altman 1997). Principal wintering range is Panama and Andes Mountains of northern and western South America, from northern and western Venezuela south through Ecuador to southeastern Peru and western Bolivia (Altman and Sallabanks 2000).

State range comments: Regularly breeds in central, south-central, southeast, and sparingly western Alaska.

Generally at low densities throughout the coniferous boreal and coastal forests of Alaska (often characterized as uncommon or rare [Armstrong 1995]). Ranges to northern and western extent of coniferous forest to Noatak River in the northwest, Bethel and Katmai areas in the west/southwest, and to Colleen and Porcupine rivers in the northeast (Kessel and Gibson 1978).

Abundance: Population estimates are suspected to be inaccurate (Rich et al. 2004, Rosenberg 2004 a and b), but are the only available estimates at this time.

Global abundance comments: 1,200,000 (Rich et al. 2004).

State abundance comments: 270,000 (Rosenberg 2004 a and b).

Trends:

Global trends: From 1966-2003 a population decline of -3.5% per year ($P < 0.01$, $n = 776$ routes) detected on the North American Breeding Bird Survey (Sauer et al. 2004).

State trends: From 1980-2002 a population decline of -3.3% per year ($P = 0.09$, $n = 49$ routes) detected on the North American Breeding Bird Survey in Alaska (Sauer et al. 2003). The period of documented population decline is shorter in Alaska due to the lack of monitoring surveys prior to 1980.

C. Problems, issues, or concerns for species (or species group)

Steep, range-wide decline in numbers of breeding birds. Current estimates suggest that the global population have been reduced by over 70% since 1966. Trend similar in Alaska as in rest of the species range. Reasons for decline unknown, but rapid losses of forested habitats on wintering grounds in the Andes foothills and mountains are a suspected but untested cause of the decline. Because the genus *Contopus* has the lowest reproductive rate of all North American passerines, lowered survival resulting from losses of favored wintering habitat could be particularly problematic for this species (Altman and Sallabanks 2000). Rates of survivorship not currently known.

Because this species is closely tied to recently burned and, to a lesser extent, bark beetle infested forests for breeding, fire suppression and salvage harvest may be detrimental to populations (Hutto 1995, Stone 1995). Harvested stands may act as “ecological traps” that attract breeding birds because of the forest opening they create but support low rates of nest success compared to favored post-fire stand because of high densities of predators supported by adjacent live stands (Altman and Sallabanks 2000).

Climate change may also affect this species by changing the energetic requirements of long-distance migration, availability of flying insects for food, frequency of fires and bark beetle epidemics, or drying of favored muskegs and forested bogs and swamps in the boreal forest (Altman and Sallabanks 2000).

D. Identify location and condition of key or important habitat areas

Breeding: Considered an indicator species of the coniferous forest biome throughout North America, although it is occasionally found in mixed deciduous/coniferous forests. In central Alaska, most often found in stands of open canopy spruce (*Picea glauca* and *P. mariana*). Usually associated with openings (muskegs, meadows, burns, and logged areas) and water (streams, beaver ponds, bogs, and lakes). Apparently requires an uneven canopy or openings for aerial hawking, and wet areas productive of insect prey. Regularly uses prominent dead or partially dead trees for perching, singing, and hawking. In central Alaska, perches averaged 1.4 times the height of surrounding tree canopy; 25% of perches were dead trees, 51% were partially dead (most with dead tops), and 24% were live. Nests were placed in live trees, primarily black spruce, that were slightly shorter than surrounding canopy (Wright 1997). Breeding habitats in Alaska are generally in good condition.

Winter: Primary wintering habitat (based on limited anecdotal information) is mature evergreen forests, particularly montane forest. Reaches highest densities in Andes in Columbia where it occurs in lightly forested areas and forested edges from 400-2,600 m. This is one of the most heavily altered habitats in South America. Andean valleys are almost completely deforested, and 85% or more of montane forests have been cut (Altman and Sallabanks 2000).

E. Identify threats or concerns associated with key habitats

On breeding grounds in Alaska forest management, particularly salvage harvest may be detrimental to this species. Climate change and associated landscape drying could decrease the suitability of muskegs, bogs, and stream-side habitat for breeding as well as alter the availability of flying insects for foraging.

On wintering grounds forests favored by this species have been one of the most heavily altered habitats in South America. Andean valleys are almost completely deforested, and 85% or more of montane forests have been cut. From an examination of 123 migrant landbirds, the Olive-sided Flycatcher was considered one of the 12 species most vulnerable to extinction from tropical deforestation primarily because of restriction to undisturbed broadleaf forest during winter (Petit et al. 1993, 1995).

F. Goal: Ensure Olive-sided Flycatcher populations are viable within natural variation throughout their distribution.

G. Develop objectives, etc., for Conservation and Management Needs

State of Alaska conservation and management needs:

Objective: Restore population to 1980 levels in Alaska.

Target: An average 3.3% increase in population size per year over the next 25 years.

Measure: Population trend estimated jointly from the North American Breeding Bird Survey (BBS) in Alaska and its complementary program in roadless areas of the state, the Alaska Landbird Monitoring Survey (ALMS).

Issue: Currently the cause of population decline is unknown but must be linked to deficits in survival, reproduction, or recruitment.

Conservation actions:

- a. Raise profile of demise of species to pique interest in the research community for exploring causes of decline.
- b. Conduct targeted demographic studies to identify deficits in reproduction and particularly, survival and recruitment and whether such deficits are linked to specific habitats, habitat changes, management actions, geographic locations, exposure to contaminants, diseases, or natural population cycles. Information on survival and recruitment are needed in particular.
- c. Conduct studies using stable isotopes and / or genetics to determine important non-breeding sites (migration stop-over, wintering) for Alaskan breeding populations and whether losses of habitats in these areas may be contributing to the decline.
- d. Based on research findings, develop and implement conservation actions in appropriate areas to reverse population decline.

Issue: There is a general lack of understanding of the breeding habitat requirements of this species in Alaska. Thus it is difficult to develop and implement strategies to conserve or enhance important areas for breeding to

help meet the objective or restoring populations to 1980's levels.

Conservation actions:

- e. Conduct field studies or analyses of existing data to determine important habitats, habitat attributes, and geographic locations for this species in Alaska. Combine such studies with conservation action b when possible.
- f. Effects of disturbance from fires, insect outbreaks, and particularly associated salvage logging activities should be evaluated.
- g. Use results from such studies to strategically protect or enhance important areas and habitats to help meet the objective of restoring populations to 1980's levels (Rosenberg 2004 a and b).
- h. Communicate the habitat needs of this species to appropriate land managers and regulatory agencies in Alaska.

Issue: Ability to maintain long-term monitoring of BBS routes in appropriate places in the state.

Conservation actions:

- i. Maintain current participation in the BBS in Alaska at a minimum. Identify individuals to adopt routes that have been discontinued; observers must commit to no fewer than three consecutive years of service.

Issue: Current knowledge of population trends is based solely on the roadside BBS which only samples a small proportion of the species breeding range in Alaska. Therefore it may be inappropriate to extend the objective for this species to outside of the BBS corridor without an appropriate evaluation of its status in roadless areas.

Conservation actions:

- j. Examine independent data on trends from migration stations or other breeding surveys to determine if declines are evident in areas away from the road system.
- k. Encourage and implement full participation in the Alaska Landbird Monitoring Survey (ALMS), whose random sampling of roadless areas will improve estimates of population size and percent global population in Alaska, reduce bias in trends associated with geographic limited BBS, improve knowledge or distribution and habitat use and, when combined with data from the BBS, increase statistical power in detecting statewide trends. Surveys should be run for no less than 25 years.

Global conservation and management needs:

Global Objective: Restore population to 1966 levels across the breeding range (Rich et al. 2004)

Target: Population level in 1966 (Rich et al. 2004). This equates to an average 3.5% annual increase in population size over the next 38 years.

Measure: Breeding Bird Survey.

Issue: Cause(s) of decline is/are unknown

Conservations actions:

- l. Collaborate with North and South American researchers and conservationists to determine causes of decline and develop and implement strategies to remediate the problem(s) once identified.
- m. Effects of forest management on breeding birds should be further evaluated. In particularly prescribed fire and silvicultural systems that mimic the natural effects of fire and beetle outbreaks should be tested as a means of enhancing habitats for this species.

Issue: Much coordination will be needed among states, provinces, and agencies to develop and implement strategies to reverse declines across the ranges of this species.

Conservations actions:

- n. Develop numerical goals for conservation (i.e., amount of habitats for restoration) appropriately for each state and province included in the species range and implement strategies for reaching these goals for each area (Rich et al. 2004).
- o. Increase the amount of land in national or provincial parks and preserves both in Canada and across wintering areas in South America.
- p. Encourage the adoption of broad-scale forest management policies that protect important breeding habitats and enhance habitats previously degraded from harvest or other management activities.

Issue: Poor understanding of linkages between breeding, staging, and wintering sites.

Conservations actions:

- q. Conduct genetic and stable isotope studies to determine linkages between breeding, staging, and wintering populations to identify important areas and habitats for distinct populations of this species.

Issue: Poor recognition of population decline among public, academia, and conservation communities.

Conservation action:

- r. Develop and distribute information about the decline to the public, academia, and conservation communities.

Issue: Current knowledge of population decline is based solely on the roadside BBS which only samples a small proportion of the species breeding range. Therefore it may be inappropriate to extend the objective for this species to outside of the BBS corridor without an evaluation of its status in roadless areas.

Conservation actions:

- s. Analyze data from appropriate migration stations and other breeding and non-breeding surveys to determine if declines are evident from independent data sets and in roadless areas, the later which may be important in supporting “source” populations.

H. Propose plan & time frames for monitoring species and their habitats

Monitoring by BBS and ALMS should be conducted annually from present for a minimum of twenty-five years. Studies of demography and habitat requirements should begin as soon as possible and continue for a minimum of five years.

BBS work is underway in Alaska through cooperative interagency efforts and a network of volunteers. At this point the ALMS, demography, and nesting habitat studies are unfunded; participants should include USGS, USFWS, NPS, BLM, USFS, DOD, State of Alaska, NGOs, universities, and private landowners, including, but not restricted to Native corporations and industry.

I. Recommend time frame for reviewing and revising the Strategy

Five-year intervals for review.

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A landbird in decline: the Blackpoll Warbler

A. Species description [or Species Group description]

Common name: *Blackpoll Warbler*

Scientific name: *Dendroica striata*

B. Distribution and abundance

Range:

Global range comments: Breeds from n. and w. Alaska, throughout Yukon and s. Northwest Territories, east and south to central plains provinces to n. Ontario, central Quebec, throughout Labrador and Newfoundland; south to New York, Maine and Massachusetts. Winters in Ecuador, Columbia, Venezuela, Peru, Chile and Peru (Terres 1980).

State range comments: In Alaska, breeds in w. Alaska as far north as Selawik and the Kobuk and lower Noatak drainages, south to Katmai, common east to central Alaska and south to the Matanuska-Susitna Valley, less common in e.-central Alaska, the Kenai Peninsula. Rare migrant in se. Alaska (Kessel and Gibson 1978, Boreal Partners in Flight 1999, Cotter and Andres 2000). Highest breeding densities were recorded in riparian areas along the tributaries of the lower Yukon and Kuskokwim rivers in western Alaska (Harwood 2002).

Abundance: Population estimates from Rosenberg (2004) are suspected to be inaccurate, but are the only available estimates at this time.

Global abundance comments: 21,000,000 birds.

State abundance comments: 6,400,000 birds.

Trends:

Global trends: Survey-wide data from North American Breeding Bird Survey, 1980 to 2003 (not including Alaska), showed a population decline of 9.2% per year ($P < 0.01$, $n = 54$ survey routes; Sauer et al. 2004). Increasing from 1966 to 1980 (Sauer et al. 2004).

State trends: Data from North American Breeding Bird Survey from 1980 to 2003 in Alaska, showed a population decline of 3.8% per year ($P < 0.01$, $n = 50$ survey routes; Sauer et al. 2004).

C. Problems, issues, or concerns for species (or species group)

Precipitous population decline: Data from the North American Breeding Bird Survey indicate that this species has suffered the steepest long-term decline of any Neotropical-Nearctic migrant landbird since 1980, with populations diminished by over 50% and 90% across breeding ranges in Alaska and Canada, respectively (Sauer et al. 2004). Large proportion (30%) of the global population estimated to breed in Alaska (Rosenberg 2004 a and b). BBS trend information may be biased.

Climate change: The causes for this decline are poorly understood; however, climate changes may be in part responsible for this trend. Recent research showed that the abundance of breeding Blackpoll Warblers from 1967 to 1996 was negatively correlated with the frequency and severity of tropical storms over the Atlantic Ocean and Gulf of Mexico during autumn passage the previous year (Butler 2000). As this species undertakes the longest migration of any North American warbler, including a continuous transoceanic autumn flight from ne. United States and se. Canada to northern South America (Nisbet et al. 1995), the Blackpoll Warbler may be particularly susceptible to mortality during migration which has been found to account for 90% of annual mortality for its congener the Black-throated Blue Warbler (*Dendroica caerulescens*; Sillert and Holmes 2002). Climate change may be further threatening the population of this species in Alaska by modifying favored riparian and bog habitats through permafrost degradation and drying.

Habitat loss: Habitat loss at breeding and non-breeding areas is another concern. Some examples include

- Logging of Canadian boreal forest. Breeding densities declined in 20 m riparian strips after surrounding habitat was removed by clearcutting (Darveau et al. 1995).
- Degradation of red spruce and subalpine spruce-fir forests resulting from acid precipitation in ne. U.S. and se.

Canada may adversely affect reproduction by eliminating favored red spruce for nesting (Smith et al. 1986, Moegenburg and Greenberg 2004).

- Deforestation of lowland Amazonia may negatively influence Blackpoll Warblers; however, little is known about habitat use during non-breeding season. One of the migrant landbirds considered most likely to be negatively affected by destruction of tropical forests.
- Degradation of important migration stopover sites, particularly in southeastern Canada, northeastern United States and northern South America.

Poor information on breeding and wintering ecology: In general, the breeding and wintering ecology of this species is poorly studied. In Alaska we have a poor quantitative understanding of what habitats and habitat attributes are important in supporting viable breeding populations of this species. Also, information on survival and reproductive output/success would be useful for developing population models to identify demographic bottlenecks for this species.

Other concerns: This species commonly collide with towers during migration (i.e. communication, wind turbines, buildings), presumably due to attraction to lights (Hunt and Eliason 1999). Wind energy development and the cell phone industry are resulting in growing numbers of towers in both the United States and Canada. Widespread use of pesticides and dioxins on wintering grounds and accumulations of such materials in Alaska may adversely influence Blackpoll Warblers.

D. Identify location and condition of key or important habitat areas

Use of habitats for breeding changes from predominantly coniferous forests in the e. and central portion of range to primarily deciduous habitats in Alaska. In Alaska, typically breeds in moist habitats along rivers, streams, or bogs particularly in deciduous forest and tall shrub thickets (particularly *Salix alaxensis* and *Alnus incana*), the latter sometimes under a sparse overstory of spruce (*Picea glauca* or *P. mariana*; particularly in central Alaska) or mixed spruce-paper birch (*Betula papyrifera*; Gabrielson and Lincoln 1959, Spindler and Kessel 1980, McCaffery 1996, Kessel 1998, Cotter and Andres 2000). Also found in similar habitats at the transition zone between tree-line taiga and either alpine or coastal tundra (Kessel 1998), with the Yukon Delta being a possible exception (McCaffery 1996). Species reaches its highest breeding density in Alaska in riparian habitats in western Alaska (McCaffery 1996, Harwood 2002). Most of these habitats are not threatened by development.

E. Identify threats or concerns associated with key habitats

Reductions in the suitability of breeding habitats used by this species across Canada and the ne. U.S. as a result of widespread resource development (forestry, oil and gas) and acid rain. Such changes may increase the value of undisturbed habitats in Alaska. Breeding habitats in Alaska generally in good condition. However, since this species is associated with riparian areas and muskegs in Alaska, patterns in landscape drying resulting from climate change may reduce the suitability of habitats favored by this species for breeding.

Threats on non-breeding areas may be of particular concern for this species. A recent examination of 123 migrant landbirds, suggested that Blackpoll Warbler is one of the 12 species most vulnerable to extinction from tropical deforestation primarily because of restriction to undisturbed broadleaf forest during winter (Petit et al. 1993, 1995). Also the quality and quantity of stopover habitats during migration may be paramount for populations of this species as it undergoes the longest migration of any North American warbler, including a continuous transoceanic migration in autumn from the Atlantic coast of southeastern Canada/northeastern United States to northern South America.

(See also the "Habitat Loss" description in section C.)

F. Goal: Ensure Blackpoll Warbler populations are viable within natural variation throughout their distribution in Alaska.

G. Develop objectives, etc., for Conservation and Management Needs

State conservation and management needs:

Objective: Restore population to 1980 levels in Alaska.

Target: An average 3.8% increase in population size per year over the next 25 years.

Measure: Population trend estimated jointly from the North American Breeding Bird Survey (BBS) in Alaska and its complementary program in roadless areas of the state, the Alaska Landbird Monitoring Survey (ALMS).

Issue: Current cause of population decline unknown but could be operating outside of Alaska on non-breeding sites. However, the decline must be linked to deficits in survival, reproduction, or recruitment.

Conservation actions:

- a. Raise profile of demise of species to pique interest in the research community for exploring causes of decline.
- b. Conduct targeted demographic studies to identify deficits in survival, reproduction, or recruitment and whether such deficits are linked with specific habitats, habitat changes, climate changes, geographic locations, or exposure to contaminants or diseases. Standardized protocols by the Monitoring Avian Productivity and Survivorship (MAPS) program and Breeding Bird Database (BBIRD) may be appropriately applied to this species to help answer some of these questions.
- c. Conduct studies using stable isotopes and / or genetics to determine important non-breeding sites (migration stop-over, wintering) for Alaskan breeding populations and whether changes in the availability or quality of habitats in these areas may be contributing to the decline.
- d. Based on research findings, develop and implement conservation actions in appropriate areas to reverse population decline.

Issue: There is a general lack of understanding of the breeding habitat requirements of this species in Alaska. Thus it is difficult to conserve or enhance important areas for breeding to help meet the objective or restoring populations to 1980's levels.

Conservation actions:

- e. Conduct field studies or analyses of existing data to determine important habitats and habitat attributes that support high densities, abundant food resources, or high rates of survival, reproduction, and recruitment. Combine such studies with conservation action b when possible.
- f. Use results from such studies to strategically protect or enhance important areas and habitats to help meet the objective of restoring populations to 1980's levels (Rosenberg 2004 a and b).
- g. Communicate the habitat needs of this species to appropriate land managers and regulatory agencies in Alaska.

Issue: Potential exposure to contaminants is a concern across their range.

Conservations action:

- h. Conduct assessment of presence of contaminants in breeding and wintering Blackpoll warblers.

Issue: Ability to maintain long-term monitoring of BBS routes in appropriate places in the state.

Conservation actions:

- i. Maintain current participation in the BBS in Alaska at a minimum. In particular, encourage running river routes annually.
- j. Identify individuals to adopt routes that have been discontinued (particularly river routes); observers must commit to no fewer than three consecutive years of service.
- k. Resume BBS routes conducted in lower Yukon and Kuskokwim rivers watersheds (done 1998-2002) biennially for 25 years.

Issue: Current knowledge of population trends is based solely on the roadside BBS which only samples a small proportion of the species breeding range in Alaska. Therefore it may be inappropriate to extend the objective for this species to outside of the BBS corridor without an appropriate evaluation of its status in roadless areas.

Conservation actions:

- l. Examine independent data on trends from migration stations, the Alaska Off-road Breeding Bird Survey (AORBBS), or other surveys to determine if declines are evident in areas away from the road system.
- m. Encourage and implement full participation in the Alaska Landbird Monitoring Survey (ALMS), whose random sampling of roadless areas will improve estimates of population size and percent global population in Alaska, reduce bias in trends associated with geographic limited BBS, improve knowledge or distribution and, when combined with data from the BBS, increase statistical power in detecting statewide trends. Surveys should be run for no less than 25 years.

Global conservation and management needs:

Global Objective: Restore population to 1980 levels across the breeding range.

Target: 1980 population level.

Measure: Breeding Bird Survey.

Issue: Cause(s) of decline is/are unknown

Conservations actions:

- n. Collaborate with North American, South American, and Caribbean researchers and conservationists to determine causes of decline.
- o. Examine further the potential role of storm frequency during fall migration over the Atlantic Ocean in causing declines in this species (Bulter 2000).
- p. Future studies on reproduction should focus on replicating previous work (Eliason 1986 a and b), complementing ongoing work on the effects of acid rain on the species (Moegenburg and Greenberg 2004), testing the effects of land management actions, or obtaining data from areas still supporting high densities of this species (i.e., Western Alaska).
- q. Determine if an assessment of wintering ground habitats and demographics could be incorporated into ongoing research on other migrant birds in South America (i.e., Cerulean Warbler).

Issue: Much coordination will be needed among states, provinces, and agencies to develop and implement strategies to reverse declines across the ranges of this species.

Conservations actions:

- r. Develop numerical goals for conservation (i.e., amount of habitats for restoration) appropriately for each state and province included in the species range and implement strategies for reaching these goals for each area (Rich et al. 2004).
- s. Increase the amount of land in national or provincial parks and wildlife preserves in Canada and across wintering areas in South America.
- t. Encourage the adoption of broad-scale land management policies that protect important breeding habitats or enhance habitats previously degraded from harvest or other management activities.
- u. Protect and enhance habitats along key migration stopover sites, particularly along the Eastern seaboard where autumn migrants depart land to undertake a continuous transoceanic crossing to South America.

Issue: Poor understanding of linkages between breeding, staging, and wintering sites.

Conservations actions:

- v. Conduct genetic and stable isotope studies to determine linkages between breeding, staging, and wintering populations to identify important areas and habitats for distinct populations of this species.

Issue: Poor recognition of population decline among public, academia, and conservation communities.

Conservation action:

- w. Develop and distribute information about the decline to the public, academic, and conservation communities.

Issue: Current knowledge of population decline is based solely on the roadside BBS which only samples a small proportion of the species breeding range. Therefore it may be inappropriate to extend the objective for this species to outside of the BBS corridor without an evaluation of its status in roadless areas.

Conservation actions:

- x. Analyze data from appropriate migration stations and other breeding and non-breeding surveys to determine if declines are evident from independent data sets.

H. Propose plan & time frames for monitoring species and their habitats

Monitoring by BBS, Yukon-Kuskokwim River BBS, and ALMS should be conducted annually from present for a minimum of twenty-five years. Studies of demography and habitat requirements should begin as soon as possible and continue for a minimum of five years. BBS work is underway in Alaska through cooperative interagency efforts and a network of volunteers. At this point ALMS and studies of demography, habitat, and identification of nonbreeding areas are unfunded. Participants should include USGS, USFWS, NPS, DOD, and BLM; State of Alaska; NGOs; private landowners; and universities.

I. Recommend time frame for reviewing and revising the Strategy

Five-year intervals for review.

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A landbird in decline: the Rusty Blackbird

A. Species description

Common name: Rusty Blackbird

Scientific name: *Euphagus carolinus*

B. Distribution and abundance

Range:

Global range comments: Breeding range extends from the west coast of Alaska to the east coast of Canada (Avery 1995). The northern extent is delineated by Kotzebue Sound and the Brooks Range in Alaska, Mackenzie Delta, Great Bear Lake, Great Slave Lake, and Nueltin Lake in Northwest Territories, the coast of Hudson Bay from Churchill, Manitoba to northern Quebec, and across Quebec to the coast of central Labrador. The southern edge of the breeding range extends from southern Alaska, through central Canada from the interior of British Columbia to the northern shores of Lake Superior and Lake Huron, through southeastern Ontario to Vermont, New Hampshire, and Maine. Also breeds on the upper peninsula of Michigan, in the Adirondack Mountains of New York, and in western Massachusetts.

Winter range is primarily in the eastern half of the United States from eastern Nebraska, Kansas, Oklahoma, and Texas to the Atlantic coast between southern Massachusetts and central Florida, and from southern Wisconsin and Michigan to the Gulf of Mexico (Avery 1995). Also winters very locally across the northernmost part of the U.S. and the southern edge of Canada from Maine to the coast of British Columbia and into southeast Alaska. A few winter in eastern Colorado; otherwise very rare visitor to western and southwestern United States and south Florida.

State range comments: Found throughout most of mainland Alaska south of the Brooks Range (Kessel and Gibson 1978). Fairly common spring migrant and breeder, locally common fall migrant, and very rare winter visitor in central Alaska. Fairly common to rare migrant and breeder in western and southwestern Alaska (Brann and Andres 1997). Rare spring migrant and possible breeder in the Brooks Range. Very rare to casual spring migrant and summer and fall visitor to the coasts of the Beaufort and Chukchi seas, the Bering Sea islands, and the coast of Bristol Bay. Uncommon spring migrant and fairly common fall migrant, rare breeder, and rare winter visitor in southcoastal Alaska. Uncommon migrant and rare to uncommon local breeder (mainland), and rare winter visitor in southeast Alaska.

Abundance: Estimates of abundance from Rich et al. (2004) and Rosenberg (2004 a and b) likely inaccurate but are the only available estimates of abundance available for the species.

Global abundance comments: 2,000,000 individuals (Rich et al. 2004).

State abundance comments: 570,000 individuals (Rosenberg 2004 a and b).

Trends:

Global trends: Population decline of -9.2% per year ($P = 0.02$, $n = 96$ routes) documented from the North American Breeding Bird Survey, 1966 to 2002 (Sauer et al. 2004).

State trends: Population decline of -5.8% per year ($P = 0.03$, $n = 25$ routes) documented from the North American Breeding Bird Survey, 1980-2002 (Sauer et al. 2004). The period of documented population decline is shorter in Alaska due to the lack of monitoring surveys prior to 1980.

C. Problems, issues, or concerns for species (or species group)

All evidence suggests that this once abundant bird has been experiencing a chronic decline since the mid-1800s. The decline appears to be accelerating and totaled 90% by three independent population surveys (Greenberg and Droege 1999). Causes of the population decline currently unknown; however, on wintering grounds destruction of wooded wetlands and blackbird control programs have been suggested while on breeding grounds acid precipitation and conversion of boreal forest wetlands have been implied (Greenberg and Droege 1999). Drying of wetlands resulting from global climate change may be a growing issue for this and other boreal wetland species in Alaska.

Increased attention needs to be given to this species now, while populations are large enough to make conservation

actions effective (Greenberg and Droege 1999). Currently no research is being conducted to determine the cause of the population decline although the decline is now well documented (Greenberg 2003). Alaska may be an important stronghold for this species and a prime area for research on breeding population since the species is still found in reasonable numbers (30% of global population, Rosenberg 2004 a and b) unlike other parts of its breeding range in Alberta and the Northwest Territories and (Greenberg 2003, S. Droege personal communication).

D. Identify location and condition of key or important habitat areas

Breeds in wet coniferous and mixed forest from the edge of tundra south to the beginning of deciduous forest and grasslands. Frequently found in fens, alder-willow thickets and bogs, muskeg, beaver ponds, tall riparian shrub, swampy shores of lakes and streams, and other forest openings such as those created by logging, fire, windthrow, and beaver activity. Likes large numbers of conifer saplings and dense foliage 2-4 m above ground. Breeding habitats in south s.-eastern part of range in Canada are being lost due to conversion to agricultural lands, logging, and oil and gas development.

During spring and fall migration will forage in stubble, pasture, plowed fields, and edges of swamps. Usually roost in wooded areas, but will occasionally roost on the ground in open fields. Wintering habitats include swamps, wet woodlands, pond edges, stream borders, cypress lagoons, marsh edges, and fields adjacent to wet areas (Avery 1995). More closely tied to wooded wetlands during the winter than any other passerine (Greenberg and Droege 1999). More than 80% of this habitat has been lost, principally to use for agriculture, since colonization of the United States. However, recent rates of conversion of wooded wetlands on wintering grounds do not explain the recent acceleration in population decline (Greenberg and Droege 1999).

In Alaska, use of habitats not well described except in e.-central Alaska, where it is found in open habitats with water where it shows a preference for areas with tall shrubs. Commonly observed perched in white spruce (36% of observation), willow (30%), 10-12% each in alder, poplar, and dead snags (Spindler and Kessel 1980). In w. Alaska found in higher breeding densities along rivers of the Seward Peninsula and tributaries of the lower Yukon and Kuskokwim rivers (Kessel 1989, Harwood 2002). Habitats in Alaska are generally largely intact and not directly disturbed by development (Greenberg 2003). In se. Alaska, found to co-occur with Red-winged Blackbirds in freshwater marshes and in sedges surrounding beaver ponds (Johnson 2003).

E. Identify threats or concerns associated with key habitats

Breeding habitats in south s.-eastern part of range in Canada are being lost due to conversion to agricultural lands, logging, and oil and gas development. Habitats in Alaska are generally largely intact and not directly disturbed by development (Greenberg 2003). However, climate change and associated degradation of permafrost and drying of ponds and lakes in Alaska could be resulting in losses of key habitats used by this species. More than 80% of forested wetlands used by this species on wintering ground have been lost, principally to agriculture, since colonization of the United States. However, more modern rates of conversion of these habitats alone do not explain the recent acceleration in population decline (Greenberg and Droege 1999).

F. Goal: Ensure Rusty Blackbird populations in Alaska are viable within natural variation throughout their distribution.

G. Develop objectives, etc., for Conservation and Management Needs

State of Alaska conservation and management needs:

Objective: Restore population to 1980 levels in Alaska.

Target: An average 5.8% increase in population size per year over the next 25 years.

Measure: Population trend estimated jointly from the North American Breeding Bird Survey (BBS) in Alaska and its complementary program in roadless areas of the state, the Alaska Landbird Monitoring Survey (ALMS).

Issue: Current cause of population decline unknown but could be operating outside of Alaska on non-breeding sites. However, the decline must be linked to deficits in survival, reproduction, or recruitment thus these should be examined.

Conservation actions:

- a. Raise profile of demise of species to pique interest in the research community for exploring causes of decline.
- b. Conduct targeted demographic studies to identify deficits in survival, reproduction, or recruitment and whether such deficits are linked with specific habitats, habitat changes, climate change, geographic locations, or exposure to contaminants or diseases.
- c. Based on research findings, develop and implement conservation strategies in appropriate areas to reverse population decline.

Issue: There is a general lack of understanding of the breeding habitat requirements of this species in Alaska. Thus it is difficult to conserve or enhance important areas to help meet the objective or restoring populations to 1980's levels.

Conservation actions:

- d. Conduct field studies or analyses of existing data to determine habitats, habitat attributes, and geographic locations that support high densities of this species during breeding and migration in Alaska. Aerial surveys of breeding birds could be explored as a means for assessing habitat needs over broad geographic areas. Combine such studies with conservation action b when possible.
- e. Use results from such studies to direct research to important areas and strategically protect or enhance important areas and habitats to help meet the objective of restoring populations to 1980's levels (Rosenberg 2004 a and b).
- f. Communicate the habitat needs of this species to appropriate land managers and regulatory agencies in Alaska.

Issue: Ability to maintain long-term monitoring of BBS routes in appropriate places in the state.

Conservation actions:

- g. Maintain current participation in the BBS in Alaska at a minimum. In particular, encourage running river routes annually.
- h. Resume BBS routes conducted in lower Yukon and Kuskokwim rivers watersheds (done 1998-2002) biennially for 25 years.

Issue: Current knowledge of population trends is based solely on the roadside BBS which only samples a small proportion of the species breeding range in Alaska. Therefore it may be inappropriate to extend the objective for this species to outside of the BBS corridor without an appropriate evaluation of its status in roadless areas.

Conservation actions:

- i. Examine independent data on trends from migration stations and other breeding surveys to determine if declines are evident in areas away from the road system.
- j. Encourage and implement full participation in the Alaska Landbird Monitoring Survey (ALMS), whose random sampling of roadless areas will improve estimates of population size and percent global population in Alaska, reduce bias in trends associated with geographic limited BBS, improve knowledge or distribution and, when combined with data from the BBS, increase statistical power in detecting statewide trends. Surveys should be run for no less than 25 years.

Global conservation and management needs:

Global Objective: Restore population to 1966 levels across the breeding range.

Target: Population level in 1966, which equates to an average increase of 9.9% in population size over the next 38 years.

Measure: Breeding Bird Survey and Christmas Bird Count (CBC).

Issue: Cause(s) of decline is/are unknown

Conservations actions:

- k. Analyze data from BBS and CBC for spatial variation in abundance and trend to identify both important areas for protection and geographic centers of decline on both breeding and wintering areas.
- l. Collaborate with North American researchers and conservationists to determine causes of decline and develop and implement strategies for remediating the problem(s) once identified (Rich et al. 2004).
- m. The affects of acidification of wetlands, blackbird control programs, and loss of forested wetlands on wintering areas on populations should be evaluated (Greenberg and Droege 1999, Greenberg 2003).

Issue: Much coordination will be needed among states, provinces, and agencies to develop and implement strategies to reverse declines across the ranges of this species.

Conservations actions:

- n. Develop numerical goals for conservation (i.e., amount of habitats for restoration) appropriately for each state and province included in the species range and implement strategies for reaching these goals for each area (Rich et al. 2004).
- o. Increase the amount of land in national or provincial parks and preserves in Canada.
- p. Encourage the adoption of broad-scale land management policies in the United States and Canada that protect important breeding and wintering habitats and enhance habitats previously degraded from land management activities.
- q. Work through the Joint Ventures to protect and enhance wetlands used by this species.

Issue: Poor recognition of population decline among public, academic, and conservation communities.

Conservation action:

- r. Develop and distribute information about the decline to the public, academic, and conservation communities.

H. Propose plan & time frames for monitoring species and their habitats

Monitoring by BBS, Yukon-Kuskokwim River BBS, and ALMS should be conducted annually from present for a minimum of twenty-five years. Studies of demography and habitat requirements should begin as soon as possible and continue for a minimum of five years. BBS work is underway in Alaska through cooperative interagency efforts and a network of volunteers. At this point the ALMS, demography, and nesting habitat studies are unfunded; participants should include USGS, USFWS, NPS, BLM, DOD, State of Alaska, NGOs, private landowners, and universities.

I. Recommend time frame for reviewing and revising the Strategy

Five-year intervals for review.

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